

## Is Native American R Y-Chromosome of African Origin?

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**Abstract:** Controversy surrounds the phylogeography and origin of the R haplotype among Native Americans. Some researchers have suggested that Europeans spread this haplotype among Native Americans. The purpose of this study was to determine the origin of the R-M173 y-chromosome among Native Americans. It is the third most frequent y-chromosome possessed by Native Americans. Native Americans with the highest frequency of R-M173 haplotypes like the Ojibwa and Seminoles mated frequently with African males. Our findings indicate that the African male, Native American female pattern of mating in the United States probably led to the introduction and spread of R-M173 among Native Americans during slavery.

**Key words:** Haplogroup, haplotype, mtDNA, Native American, y-chromosome

### INTRODUCTION

Native Americans (NA) carry a high frequency of R haplotypes (Malhi *et al.*, 2008). In a recent issue of AJPA Malhi *et al.* (2008) indicated that the high frequency of the y-chromosome R-M173 among NA populations living in the Northeastern and Southeastern parts of the United States of America (USA) is likely the result of male European introgression after their contact. This view is also supported by Zegura *et al.* (2004).

This scenario may not account for the high frequency of R1 among NA populations, NA and European relations were primarily hostile (O'Brien, 2011). This direction of NA and European interaction is best illustrated by the numerous wars these populations were engaged in, and popular European cultural sentiments which promoted separation of the races, and racism directed at NA (O'Brien, 2011). This racism was not conducive to furthering NA and European American (EA) intermarriage.

Whereas the history of EA and NA contact did not favor widespread mating between these populations, there is a long history of intimate contact between NA and Sub-Saharan African (SSA) populations in the USA since 1501 (Chambers, 1891; June-Friesen, 2010; May, 1994; Katz, 2011). These Blacks formed many maroon and Black Native American communities as represented in Illustration 1 and 2. This suggests that whereas Malhi *et al.* (2008) favor a EA trajectory for the spread of R-M173 among NA populations, African males during slavery may be responsible for the introduction of R-M173 among some NA populations in the Southeastern and Northeastern parts of the USA. The purpose of this study is to determine what male population: African or European is responsible for the spread of R-M173 among Native Americans in the United States.



Illustration 1: Black maroons



Illustration 2: Black florida native American

### MATERIALS AND METHODS

In this study we looked at the literature of NA and SSA y-chromosomes. This data set of NA and SSA haplotypes is comprised of previously published y-chromosome data sets of NA and SSA males. This sample combines the published y-chromosome data of NA and SSA carriers of R-M173 and the R1 sub-clades.

Table 1: Frequency of the R1b sub-clades in North America

Norm	Haplogroup	Frequency Native	
		American carriers	References
398	R-M17	1.5%	Hammer <i>et al.</i> (2005)
398	R-P25*	0.3	Hammer <i>et al.</i> (2005)
398	R-M269	21.9	Hammer <i>et al.</i> (2005)
186	R-P25	0.054	Zegura <i>et al.</i> (2004)*
186	R-M207	-	Zegura <i>et al.</i> (2004)
186	R-M173	-	Zegura <i>et al.</i> (2004)
-	R-M173	73%	Malhi <i>et al.</i> (2008)**

\*: The Zegura *et al.*, (2004) study did not differentiate between the types of R clades. There was only mention of the fact that 76 out of 79 Native American R lineage chromosomes belonged to R-P25; \*\*: This represents 73% of the native American populations analyzed in Malhi *et al.*, (2008)

Table 2: Native American populations possessing R-M173

Population	Norm	Percent
Chipewyan	48	(15) 31
Dogrib	15	(6) 40
Papago	-	30
Ojibwa	-	79
Tanana	11	(1) 0.09
Apache	94	(5) 0.053
Navajo	75	(2) 0.027
Seminole	20	(10) 50
TM Chippewa	34	(3) 0.088
West Chippewa	29	(20) 69
Chey/Arap	50	(8) 16
Cherokee	30	(14) 47
Choctaw	12	(1) 0.08
Creek	12	(2) 17

## RESULTS

Cruciani *et al.* (2010) provides us with a critical examination of the distribution of R1\*-M173. Winters (2010) presents a genetic pattern of this haplogroup from Africa to Eurasia, and the dispersal of a significant African male contribution to Eurasia. Although Cruciani *et al.* (2010) gives a fine discussion of R1-M173 in Africa and Eurasia he fails to discuss the y-chromosome in the America.

Native Americans carry a high frequency of R-M173 (Malhi *et al.*, 2008). The most predominate y-chromosome in North America is R-M173. R-M173 is found only in the Northeastern United States along with mtDNA haplogroup X (25%). Both haplogroups are found in Africa, but are absent in Siberia.

There are varying frequencies of y-chromosome M-173 in Africa and Eurasia. Whereas only between 8 and 10% of M-173 is carried by Eurasians, 82% of the carriers of this y-chromosome are found in Africa.

This is very interesting given that R-M173 is found among many American Indian groups. R-M173 among the North American Algonquian group range from Ojibwa (79%), Chipewyan (62%), Seminole (50%), Cherokee (47%), Dogrib (40%) and Papago (38%) (Malhi *et al.*, 2008).

In Table 1, we notice that R1 clades among NA populations vary. The NA populations that possess the R-M173 haplotypes are predominately found in the Northeastern and Southeastern parts of the USA (see Table 2).

The pristine form of R1\*-M173 is found only in Africa (Cruciani *et al.*, 2010). In 2010, the name for the African R\*1-M173 paragroup R-P25\* was changed into haplogroup V88 or R1b1c

The frequency of Y-chromosome R1\*-M173 in Africa range between 7-95% and averages 39.5% (Coia *et al.*, 2005). The R\*-M173 chromosome is found frequently in Africa, but rare to extremely low frequencies in Eurasia. The Eurasian R haplogroup is characterized by R1b3-M269. The M269 derived allele has a M207/M173 background.

In addition to R1b1c, we also find R1b1\*. Haplotypes R1b1, R1b12, R1a and R-M269 is common among Niger-Congo speakers including the Fulani and Bantu, in addition to pygmy populations (Gemna *et al.*, 2009; Wood *et al.*, 2005). Although some researchers have suggested an Eurasian origin for the Fulani, their origin lies in Africa (Winters, 2010).

## DISCUSSION

The second major y-chromosome among Native Americans is R-M173. Even though R-M173 is widespread in Europe, the pattern of EA and NA interactions, mainly violent confrontations, as Europeans expanded westward fails to support the hypothesis that EA spread haplogroup R to NA (O'Brien, 2011). Whereas EA and NA relations were antagonistic, African slaves had a very intimate relationship with NA (Katz, 2011).

An undetermined number of African slaves fled into Indian territory during slavery (Katz, 1997). Among NA populations SSA slaves began new lives and married NA females (Illustration 4), among many NA groups especially the Seminoles. As a result, ex-slave SSA males played an important role in the Creek and Seminole nations-often serving as interpreters, chiefs and counselors (Katz, 2011) (Illustration 3).

African and Native Americans came in contact during the European conquest of the Americas. Thousands of SSA males ran away from the plantations to Indian Territory where they founded many maroon societies or lived on tribal lands (Katz, 2011) (Illustration 1). These runaway slaves held extensive land holdings in Florida and in Nova Scotia, near Halifax during the American slave period (Chambers, 1891).

There were so many SSAs among the Iroquois and other Northeastern American tribes that in 1726, 1764 and 1765, the governor of Colonial New York exacted a promise from the Delaware, Huron and Iroquois



Illustration 3: African males and Indians



Illustration 4: Native American females and black offspring

Confederation, to return runaway slaves (Katz, 2011). Although NA nations gave this promise to the governor no slaves were ever returned.

There are reports of numerous marriages between NA females and SSA males. Intermarriage between NA and SSA populations between British Columbia and New England was especially high. Massachusetts was a major center of NA and SSA intermixture. Many SSA slave males married NA females because the offspring became free (Chambers, 1891). As early as 1763, in places like Martha's Vineyard, Tilburg, Chilmack and Chappaquiddick, Massachusetts almost one-fourth of the NA were married to SSA males (Chambers, 1891). For example, in the 1790 U.S. Census it was reported that 6001 "persons other than white" 400 were SSA, and 2000 were mixed NA and SSA (Chambers, 1891).

There were also intermarriage between NA and SSA populations in the southern United States (Katz, 2011). In 1526, African slaves fled their Spanish masters and settled in South Carolina Indian Territory.

The first slaves were sold to the English colonist in 1620 (Chambers, 1891). In 1622, NA overran the Jamestown Virginia colony killing all the whites, and integrating the African slaves into NA communities (Katz, 2011). As a result, it was recognized that many free born Blacks on the Chesapeake Peninsula were of NA and SSA origin in 1700 (Chambers, 1891; Katz, 2011).

The largest settlement of SSA in the South was in Florida. Here there was 50 miles of farmland, cattle and etc., owned by Maroons. The SSA in Florida freely mixed with the Creek and Seminoles. It was estimated by a certain Mr. Munroe in 1887 that more than half of the NA and SSA populations in Florida was mixed (Chambers, 1891). Other SSA were married to NA females belonging to the Cherokee, Choctaw, and Creek nations.

In addition to intermarriage among NA and SSA populations in the Northeastern and Southern USA, there was considerable intermarriage among NA and SSA in the Midwest. In Minnesota, for example, in 1819 at the mouth of the St. Louis River, there were SSA living in Ojibwa villages (Chambers, 1891).

## CONCLUSION

In conclusion, many West African slaves were brought to the United States that carried R-M173. This y-chromosome has the third highest frequency among West Africans.

The historical evidence makes it clear that many African males married NA females (Chambers, 1891; Katz, 2011). It is interesting to note that those NA groups with the highest frequencies of the R1 y-chromosome including the Ojibwa (79%), Seminole (50%), and Cherokee (47%) are NA populations that experienced considerable intermarriage between NA females and SSA males. Given the interbreeding between NA and SSA populations the presence of R-M173 among NA groups probably represents the sex biased admixture between NA females and SSA males (Bryc *et al.*, 2010).

Even though we may be able to use the involuntary migration of SSAs to the USA, to account for the high frequency of R1b among such groups as the Ojibwa, Seminoles and Cherokees, this does not explain the presence of Rb1 in other NA populations. This indicates that we need further research into the relationship between R-P25 among NA, in comparison to populations carrying this y-chromosome in Africa and Eurasia. Further research in this direction may help us to refine our understanding of NA population history. In this direction it might be especially illuminating in the examination of R-P25 if researchers look for M335 (Adams *et al.*, 2006; Sims *et al.*, 2007).

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